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7. (amended) A vector comprising a promoter operably linked to a nucleic acid sequence according to claim 5, capable of directing the expression of a mutant human β -globin polypeptide.

14. (amended) A modified human hemoglobin according to claim 10 or 13 comprising a mutant human α -globin polypeptide comprising the amino acid sequence of normal human α -globin modified by the substitution or deletion of Cys at position 104.

15. (amended) A modified human hemoglobin according to claim 14 wherein the mutant human α -globin polypeptide is further modified by either the substitution of Cys for Ala at position 71, or the substitution of Cys for Ala at position 53.

17. (amended) A polymeric hemoglobin comprising a modified human hemoglobin according to claim 10, 13 or 16, wherein adjacent hemoglobins are covalently bonded to each other by one or more disulfide bridges formed by cysteine amino acid residues.

24. (amended) A mutant human α -globin polypeptide according to claim 23, further modified by either the substitution of Cys for Ala at position 71, or the substitution of Cys for Ala at position 53.